What is claimed is:

1. A method for producing cross-linked, millable oil-resistant elastomers and oil-seal members made therefrom by polyaddition of at least one polyester diol and at least one diisocyanate, comprising the steps of:

selecting the kinds and blend proportion of the at least one polyester diol and the at least one diisocyanate, respectively, so that the resulting polyurethane has an ester group concentration of at least about 25 wt.% (5.7 mmol/g) and less than about 35 wt.% (8 mmol/g) and a urethane group concentration of at least about 7 wt.% (1.2 mmol/g) and less than about 12 wt.% (2.0 mmol/g);

reacting the at least one polyester diol and at least one diisocyanate to produce a millable polyurethane, and

crosslinking the millable polyurethane with a curing agent to form an oil-resistant elastomer which has a rubber hardness of JIS A 95° or less and an elongation at break of at least 100%, wherein the elastomer exhibits a percent change in weight, when exposed to IRM 903 lubricating oil, of 20% or less.

2. A method of claim 1, wherein the at least one polyester diol comprises aliphatic polyester diol containing no side chain.

3. A method of claim 2, wherein the polyester diol consists essentially aliphatic polyester diol containing no side chain.

4. A method of claim 1, wherein the polyester diol comprises poly(ε-caprolactone diol).

5. A method of claim 4, wherein the polyester diol consists essentially poly(ε-caprolactone diol).

6. A method for producing an oil-resistant elastomer of claim 1, which has a glass transition temperature of about -30°C or lower.

7. An oil-seal member which is formed from at least one oil-resistant elastomer; wherein the oil-resistant elastomer has a rubber hardness of about JIS A 95° or less and an elongation at break of at least 100%, the elastomer being cross-linked

millable polyurethane obtained by polyaddition of at least one polyester diol and at least one diisocyanate, wherein the polyurethane has an ester group concentration of at least about 25 wt.% (5.7 mmol/g) and less than about 35 wt.% (8 mmol/g) and a urethane group concentration of at least about 7 wt.% (1.2 mmol/g) and less than about 12 wt.% (2.0 mmol/g), wherein the elastomer exhibits a percent change in weight, when exposed to IRM 903 lubricating oil, of about 20% or less.

8. An oil-seal member of claim 7, wherein the at least one polyester diol comprises aliphatic polyester diol containing no side chain.

9. An oil-seal member of claim 8, wherein the polyester diol consists essentially aliphatic polyester diol containing no side chain.

10. An oil-seal member of claim 7, wherein the polyester diol comprises poly(ε-caprolactone diol).

11. An oil-seal member of claim 10, wherein the polyester diol consists essentially poly(ε-caprolactone diol).

12. An oil-seal member of claim 7, which has a glass transition temperature of -30°C or lower.